

REMARKS

The following responds to the rejections set forth by the Examiner in the Office Action of August 21, 2007. In the Office Action, the Examiner rejected claims 1-3, 6, and 8-14, and allows claims 55-62. As a preliminary matter, Applicants thank the Examiner for the allowance of claims 55-62. Claims 1, 3, and 9 have been amended and claim 11 has been cancelled. Claims 29-54 have been previously withdrawn. Claims 1-3, 6, 8-10, 12-14, 28, and 55-62 remain pending in this application.

I. Claim Rejection Under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claim 11 under 35 U.S.C. Sec. 112. Claim 11 has been cancelled, thus rendering the Examiner's rejection moot.

II. Claim Rejections Under 35 U.S.C. § 102(e)

In the Office Action of August 21, 2007, the Examiner rejected claims 1-3, 6, 10, and 12-14 as being anticipated under 35 U.S.C. § 102(e) by U.S. Patent No. 7,060,617 B2, issued on January 13, 2006 by Dubin et al. (hereinafter "Dubin"). Applicants respectfully traverse the Examiner's grounds for rejection.

Amended claim 1 is directed to a method for depositing copper overlying a work piece. The method comprises the steps of depositing overlying the work piece a barrier layer having a surface and forming a protective layer that overlies the surface of the barrier layer and that inhibits oxidation of the surface. The protective layer is formed by exposing the barrier layer to diborane, a sulfur-containing gas, or a phosphorous-comprising gas. The protective layer is removed, and, after removing the protective layer, copper is electrochemically deposited overlying the barrier layer.

In contrast, Dubin does not disclose a method for depositing copper that includes forming a protective layer that overlies a barrier layer and that inhibits oxidation of the barrier layer surface, wherein the protective layer is formed by exposing the barrier layer to diborane, a sulfur-containing gas, or a phosphorous-comprising gas. Thus, as Dubin does not disclose every element of amended claim 1, it does not anticipate amended claim 1, or claims 2-3, 6, 10, or 12-14 that depend therefrom.

III. Claim Rejections Under 35 U.S.C. § 103(a)

In the Office Action, the Examiner rejected claims 8 and 9 as being unpatentable over Dubin in view of U.S. Patent No. 7,081,370 issued to Kumagai et al. on July 25, 2006. Applicants respectfully traverse the Examiner's rejections.

Claims 8 and 9 depend from claim 1. As explained above with respect to claim 1, Dubin does not disclose a method for depositing copper that includes forming a protective layer that overlies a barrier layer and that inhibits oxidation of the barrier layer surface, wherein the protective layer is formed by exposing the barrier layer to diborane, a sulfur-containing gas, or a phosphorous-comprising gas. Kumagai does not rectify the shortcomings of Dubin because Kumagai also does not disclose, teach or suggest a protective layer formed by exposing the barrier layer to diborane, a sulfur-containing gas, or a phosphorous-comprising gas. Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness has not been made out by the Examiner with respect to claims 8 and 9 because every critical element appearing in the claims is not disclosed by Dubin in view of Kumagai.

IV. Conclusion

In view of Applicants' amendments and remarks, it is respectfully submitted that the Examiner's rejections under 35 U.S.C. §§ 112, 102(e), and 103(a) have been overcome. Accordingly, Applicants respectfully submit that the application, as amended, is now in condition for allowance, and such allowance is therefore earnestly requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the Applicants' attorneys at the below-listed number.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the

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required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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Dated: October 29, 2007

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